No. 8600128

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Holden's Foundation Seeds, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT TY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT . 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

CORN

'LH54'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of* Washington, D. C. *this* 30th *day of* January *in the year of our Lord one thousand nine hundred and* eighty-seven.

Attest:

Kenneth B. Evans
Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Richard E. Lyng
Secretary of Agriculture

APPROVAL EXPIRES 4-30-85

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

FORM APPROVED: OMB NO. 0581-0055

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S)
Holden's Foundation Seeds, Inc.

2. TEMPORARY DESIGNATION
Ex1008

3. VARIETY NAME
LH54

4. ADDRESS *(Street and No. or R.F.D. No., City, State, and Zip Code)*
R.R.#2, P.O. Box 839
Williamsburg, IA 52361

5. PHONE *(Include area code)*
319-668-1100

FOR OFFICIAL USE ONLY

PVPO NUMBER
8600128

6. GENUS AND SPECIES NAME
Zea mays

7. FAMILY NAME *(Botanical)*
Gramineae

FILING
DATE May 27, 1986
TIME 10:00 ☑ A.M. ☐ P.M.

8. KIND NAME
Corn Field

9. DATE OF DETERMINATION
November 1984

FEES RECEIVED
AMOUNT FOR FILING
$ 1800.
DATE May 27, 1986
AMOUNT FOR CERTIFICATE
$ 200.00
DATE December 19, 1986

10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION *(Corporation, partnership, association, etc.)*
Corporation

11. IF INCORPORATED, GIVE STATE OF INCORPORATION
Iowa

12. DATE OF INCORPORATION
1968

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS
Mr. Mark Armstrong
P.O. Box 839
Williamsburg, IA 52361
PHONE *(Include area code)*: 319-668-1100

14 CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED

a. ☒ Exhibit A, Origin and Breeding History of the Variety *(See Section 52 of the Plant Variety Protection Act.)*
b. ☒ Exhibit B, Novelty Statement.
c. ☒ Exhibit C, Objective Description of Variety *(Request form from Plant Variety Protection Office.)*
d. ☒ Exhibit D, Additional Description of Variety.
e. ☒ Exhibit E, Statement of the Basis of Applicant's Ownership.

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? *(See Section 83(a) of the Plant Variety Protection Act.)* ☐ Yes *(If "Yes," answer items 16 and 17 below)* ☒ No

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
☐ Yes ☐ No

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?
☐ Foundation ☐ Registered ☐ Certified

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?
☐ Yes *(If "Yes," give date)*
☒ No

19. HAS THE VARIETY BEEN RELEASED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES ?
☐ Yes *(If "Yes," give names of countries and dates)*
☒ No

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT
Ronald Holden
DATE MAY 20, 1986 RJS 9/25/86

SIGNATURE OF APPLICANT
DATE

FORM WA-470 (7-84) (Edition of 3-84 is obsolete.)

Exhibit A

'LH54' was developed through a pedigreed system of breeding. On the following page is a schematic description of the development of 'LH54'. Also included are copies of pages from Holden's Foundation Seeds nursery books. The rows associated with the development of 'LH54' have been highlighted.

Attached is a statement from the originating plant breeder, Art Johnson, Holden's Foundation Seeds and Tom DeCourcy plant breeder, Holden's Foundation Seeds stating that the line 'LH54' is uniform, stable and free of variance the last three generations of increase.

Exhibit A

Origin and Breeding History of the Inbred

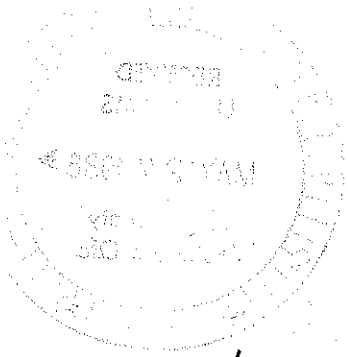
LH54=Ex1008=610 x Mo17)3

Row	Pedigree	Location	Level of Inbreeding	Year
3172 x 3175	Mo17 x (610 x Mo17)	Hawaii	Backcross	1978
13161	Mo17(619 x Mo17)	Iowa	Backcross	1978
2430-2434	Mo17(610 x Mo17)Mo17	Hawaii	Self Poll.	1979
2673	Mo17(610 x Mo17)(Mo17)⊠1	Iowa	⊠1	1979
2459	Mo17(610 x Mo17)Mo17⊠1	Iowa	⊠2	1980
781	610 x Mo17)3⊠3	Iowa	⊠3	1981
5305	610 x Mo17)3⊠4	Hawaii	⊠4	1982
26009	610 x Mo17)3⊠4	Iowa	⊠5	1982
12950	610 x Mo17)3⊠5	Hawaii	⊠6	1983
15808	610 x Mo17)3⊠6	Iowa	⊠7	1983
435-444	Ex1008	Hawaii		1984
Adolfe	LH54	Hawaii		1985
Ward	LH54	Iowa		1985

8600128

Exhibit A

The pedigree description of 'LH54'needs clarification in regard to the number of selfs. The first two generations were back crossed with Mo17. The third generation was selfed. The next seven generations were selfed in order, but the numbers in the nursery books are not correct. The selection numbers behind the pedigree in the nursery book substantiate the numbers of selfs.



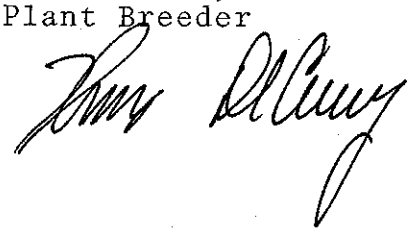
8600128

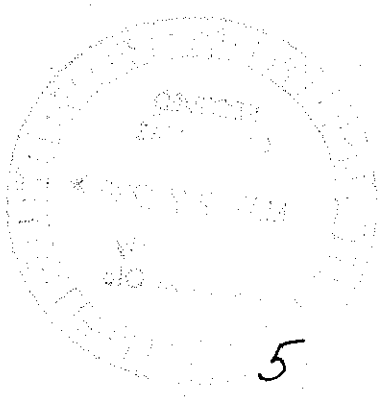
Exhibit A

Uniformity Statement

I have observed 'LH54' in Hawaii for the first two generations of increase; Hawaii Tamura field rows 435-444 and Hawaii Adolfs field. In each of the increases seeds from the previous generations were planted. The line is very stable, uniform and free of variance from within the population.

Tom DeCourcy
Plant Breeder





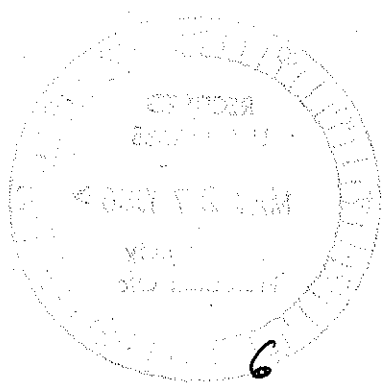
8600128

Exhibit A

Uniformity Statement

I have observed 'LH54' during the last generation it was increased, Ward-Felling Field, Iowa 1985. In this increase seeds from the previous generation were planted. The line is very stable, uniform and free of variance from within the population.

Art Johnson
Plant Breeder



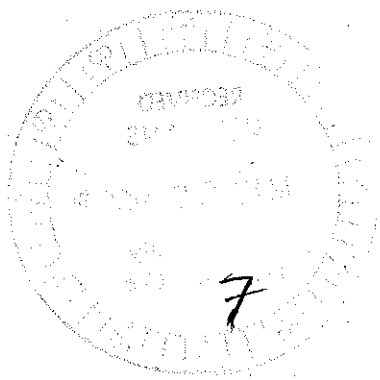
6

8600128

Exhibit B

Novelty Statement

'LH54' most closely resembles the corn inbred line 'Mo17Ht' however, the most distinguishing characteristic is that 'LH54' has green color silks while 'Mo17Ht' has salmon color silks.



FORM APPROVED. OMB NO. 40-R3712

FORM GR-470-28
(2-15-74)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
HYATTSVILLE, MARYLAND 20782

EXHIBIT C
(Corn)

OBJECTIVE DESCRIPTION OF VARIETY
CORN *(ZEA MAYS)*

NAME OF APPLICANT(S)
Holden's Foundation Seeds, Inc.

ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)*
R.R.#2, P.O. Box 839
Williamsburg, IA 52361

FOR OFFICIAL USE ONLY

PVPO NUMBER
8600128

VARIETY NAME OR TEMPORARY DESIGNATION
LH54

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. [0][8][9] or [0][9]) when number is either 99 or less or 9 or less.

1. TYPE:

[2] 1 = SWEET 2 = DENT 3 = FLINT 4 = FLOUR 5 = POP 6 = ORNA. ,ENTAL

2. REGION WHERE BEST ADAPTED IN THE U.S.A.:

[7] 1 = NORTHWEST 2 = NORTHCENTRAL 3 = NORTHEAST 4 = SOUTHEAST
5 = SOUTHCENTRAL 6 = SOUTHWEST 7 = MOST REGIONS

3. MATURITY (In Region of Best Adaptability):

(Under "comments" (pg. 3) state how heat units were calculated)

[8][0]	DAYS FROM EMERGENCE TO 50% OF PLANTS IN SILK	[1][4][3][4] HEAT UNITS
[0][0]	DAYS FROM 50% SILK TO OPTIMUM EDIBLE QUALITY	[0][0][0][0] HEAT UNITS
[0][0]	DAYS FROM 50% SILK TO HARVEST AT 25% KERNEL MOISTURE	[0][0][0][0] HEAT UNITS

4. PLANT:

[1][5][3] CM. HEIGHT (To tassel tip)

[0][6][3] CM. EAR HEIGHT (To base of top ear)

[1][2] CM. LENGTH OF TOP EAR INTERNODE

Number of Tillers:

[1] 1 = NONE 2 = 1–2 3 = 2–3 4 = > 3

Number of Ears Per Stalk:

[1] 1 = SINGLE 2 = SLIGHT TWO-EAR TENDENCY
3 = STRONG TWO-EAR TENDENCY 4 = THREE-EAR TENDENCY

Cytoplasm Type:

[1] 1 = NORMAL 2 = "T" 3 = "S" 4 = "C" 5 = OTHER (Specify) _____

5. LEAF (Field Corn Inbred Examples Given):

Color: 5GY 4/4 Munsell Color Charts for Plant Tissues

[ ] 1 = LIGHT GREEN (HY) 2 = MEDIUM GREEN (WF9) 3 = DARK GREEN (B14) 4 = VERY DARK GREEN (K166)

Angle from Stalk (Upper half):

[1] 1 = < 30° 2 = 30–60° 3 = > 60°

Sheath Pubscence:

[1] 1 = LIGHT (W22) 2 = MEDIUM (WF9)
3 = HEAVY (OH26)

Marginal Waves:

[2] 1 = NONE (HY) 2 = FEW (WF9) 3 = MANY (OH7L)

Longitudinal Creases:

[3] 1 = ABSENT (OH51) 2 = FEW (OH56A)
3 = MANY (PA11)

Width:

[0][9] CM. WIDEST POINT OF EAR NODE LEAF

Length:

[0][5][9] CM. EAR NODE LEAF

[0][9] NUMBER OF LEAVES PER MATURE PLANT

8

6. TASSEL:

[0 3] NUMBER OF LATERAL BRANCHES

Branch Angle from Central Spike:

[2] 1 = < 30° 2 = 30–40° 3 = > 45°

Penduncle Length:

[0 6] CM. FROM TOP LEAF TO BASAL BRANCHES

Pollen Shed:

[2-3] 1 = LIGHT (WF9) 2 = MEDIUM 3 = HEAVY(KY21)

[1] **Anther Color:** 1 = YELLOW 2 = PINK 3 = RED 4 = PURPLE 5 = GREEN

[6] **Glume Color:** 6 = OTHER (Specify) green w/brown margin

Pollen Restoration for Cytoplasms (o = Not Tested, 1 = Partial, 2 = Good)

[0] "T" [0] "S" [0] "C" [0] OTHER (Specify Cytoplasm and degrees of restoration) _____

7. EAR (Husked Ear Data Except When Stated Otherwise):

[1 8] CM LENGTH [3 5] MM. MID-POINT DIAMETER [8 9] GM. WEIGHT

Kernel Rows:

[1] 1 = INDISTINCT 2 = DISTINCT [1 0] NUMBER

[1] 1 = STRAIGHT 2 = SLIGHTLY CURVED 3 = SPIRAL

Silk Color (Exposed at Silking Stage):

[1] 1 = GREEN 2 = PINK 3 = SALMON 4 = RED

Husk Color:

[1] FRESH [6] DRY — 1 = LIGHT GREEN 2 = DARK GREEN 3 = PINK 4 = RED 5 = PURPLE 6 = BUFF

Husk Extention: (Harvest Stage)

[2] 1 = SHORT (Ears Exposed) 2 = MEDIUM (Barely Covering Ear) 3 = LONG (8–10CM Beyond Ear Tip) 4 = VERY LONG (> 10 CM)

Husk Leaf:

[1] 1 = SHORT (< 8 CM) 2 = MEDIUM (8–15 CM) 3 = LONG (> 15 CM)

Shank:

[1 6] CM LONG [6] NO. OF INTERNODES

Position at Dry Husk Stage:

[1] 1 = UPRIGHT 2 = HORIZONTAL 3 = PENDENT

Taper:

[1] 1 = SLIGHT 2 = AVERAGE 3 = EXTREME

Drying Time (Unhusked Ear):

[2] 1 = SLOW 2 = AVERAGE 3 = FAST

8. KERNEL (Dried):

Size (From Ear Mid-Point):

[1 0] MM LONG [0 9] MM. WIDE [0 4] MM. THICK

Shape Grade (% Rounds)

[3] 1 = < 20 2 = 20–40 3 = 40–60 4 = 60–80 5 = > 80

9

8. KERNEL (Dried) :

1 R/S 9/25/86

[4] Pericarp Color: 1 = COLORLESS 2 = RED-WHITE CROWN 3 = TAN 4 = BRONZE 5 = BROWN 6 = LIGHT RED 7 = CHERRY RED 8 = VARIEGATED (Describe) _____

[1] Aleurone Color: 1 = HOMOZYGOUS 2 = SEGREGATING (Describe) _____

[1] 1 = WHITE 2 = PINK 3 = TAN 4 = BROWN 5 = BRONZE 6 = RED 7 = PURPLE 8 = PALE PURPLE 9 = VARIEGATED (Describe) _____

[3] Endosperm Color: 1 = WHITE 2 = PALE YELLOW 3 = YELLOW 4 = PINK-ORANGE 5 = WHITE CAP.

Endosperm Type:

[3] 1 = SWEET (su1) 2 = EXTRA SWEET (sh2) 3 = NORMAL STARCH 4 = HIGH AMYLOSE STARCH 5 = WAXY STARCH 6 = HIGH PROTEIN 7 = HIGH LYSINE 8 = OTHER (Specify) _____

[3][2] GM. WEIGHT /100 SEEDS (Unsized Sample)

9. COB:

[1][8] MM. DIAMETER AT MID-POINT

Strength:

[2] 1 = WEAK 2 = STRONG

Color:

[3] 1 = WHITE 2 = PINK 3 = RED 4 = BROWN 5 = VARIEGATED 6 OTHER (Specify) _____

10. DISEASE RESISTANCE (O = Not Tested, 1 = Susceptible, 2 = Resistant):

[0]	STALK ROT (Diplodia)	[0]	STALK ROT (Fusarium)	[0]	STALK ROT (Gibberella)
[0]	NORTHERN LEAF BLIGHT	[0]	SOUTHERN LEAF BLIGHT	[0]	SMUT
[0]	SOUTHERN RUST	[0]	CORN SMUT	[0]	BACTERIAL WILT
[0]	BACTERIAL LEAF BLIGHT	[0]	MAIZE DWARF MOSAIC	[0]	STUNT
[0]	OTHER (Specify)				

11. INSECT RESISTANCT (O = Not Tested, 1 = Susceptible, 2 = Resistant):

[0]	CORNBORER	[0]	EARWORM	[0]	SAPBEETLE	[0]	APHID
[0]	ROOTWORM (Northern)	[0]	ROOTWORM (Western)				
[0]	ROOTWORM (Southern)	[0]	OTHER (Specify) _____				

12. VARIETIES MOST CLOSELY RESEMBLING THAT SUBMITTED FOR THE CHARACTERS GIVEN:

CHARACTER	VARIETY	CHARACTER	VARIETY
Maturity	LH 38	Kernel Type	Mo17Ht
Plant Type	Mo17Ht	Quality (Edible)	
Ear Type	Mo17Ht	Usage	Mo17Ht

REFERENCES:

U.S. Department Agriculture. Yearbook 1937.

Corn: Culture, Processing, Products. 1970 Avi Publishing Company, Westport, Connecticut. (Numerous (Authors)

Emerson, R.A., G.W. Beadle, and A.C. Fraser. A Summary of Linkage Studies in Maize.Cornell A.E.S., Mem. 180. 1935.

The Mutants of Maize. 1968. Crop Science Society of America. Madison, Wisconsin.

Stringfield, G.H. Maize Inbred Lines of Ohio. Ohio A.E.S. Bul. 831. 1959.

Butler, D.R. 1954 — A System for the Classification of Corn Inbred Lines — PhD. Thesis, Ohio State University.

COMMENTS:

Exhibit D

Additional Description of the Inbred

'LH54' has some other characteristics that distinguish it from 'Mo17Ht'. 'LH54' is darker in color than 'Mo17Ht'. Using other Munsell Color Charts for Plant Tissues as a reference, 'LH54' would be classified as 5GY4/4 and 'Mo17Ht' would be classified as 5GY6/6.

'LH54' reaches anthesis sooner than 'Mo17Ht'. 'LH54' reaches mid pollen 6 days and mid silk 7 days before 'Mo17Ht'. When using heat units, 'LH54' reaches mid pollen and mid silk 175 and 159 heat units respectively earlier than 'Mo17Ht'.

'LH54' is shorter in plant and ear height than 'Mo17Ht'.

Exhibit E

Statement of Applicants Ownership

Holden's Foundation Seeds, Inc., Williamsburg, Iowa, believes it is the sole owner and breeder of the 'LH54' field corn inbred for which it solicits a certificate of protection.